a useful glossary and at the end of each chapter there is a list of references.

There is no doubt that this will be a useful book to have around, but for the biochemist I think its main value will be as a reference book. For students it seems less satisfactory, for it is written as an encyclopaedia and is neither critical enough nor does it indicate sufficiently what is yet to be discovered. Thus the student may fail to get the basic facts and to be excited by the subject. A few points may indicate what I have in mind.

In chapter ten, ribosomes are considered and on page 184 their biological properties are described. It is stated that ribosomes from one tissue (heart) can catalyse protein synthesis of a kind associated with another organ such as the liver. In the quoted reference no such claim is made and indeed this important point concerning the universal nature of ribosomes from different tissues has not been settled. The piece about mitochondrial RNA on page 225 is very muddled and the experiments which demonstrate clearly that mitochondria contain ribosomal RNA which is typical of 70*S* rather than 80*S* ribosomes are not mentioned. Moreover, the idea that mitochondrial DNA may be required for the synthesis of ATP (page 229) comes as something of a surprise. The chapter on lysosomes seems to me very dull without a description of their function in the intracellular digestive tract. Finally, in the chapter on differentiation, the "Jacob–Monod" scheme is described, but there is no proper consideration of the difficulty of applying these ideas to explain the phenomenon of differentiation.

As a biochemist, therefore, I find this book too descriptive but it is well and profusely illustrated and it will certainly be useful.

P. N. CAMPBELL

TESTING DRUGS

Proving New Drugs

A Guide to Clinical Trials. By Ben-Zion Taber. Pp. xxi+182. (Geron-X: Los Altos, California, 1969.) $12.

THE author, who is the medical director of Syntex Laboratories in Palo Alto, intends this book "for all who will participate in the complex field of drug investigation", but it is essentially a primer for workers in medical departments of American drug firms. After a historical introduction, here called a preface, the various stages of investigation through which a new drug passes are clearly described, but with inappropriate pomp and dignity. Part one of the book, on the participants in clinical trials, begins with a chapter on the pre-clinical testing that must precede the first use of a drug in man. The second chapter outlines the functions and qualifications of the "monitor" (the coordinator and leader) of a "new drug investigation program". There is then a short chapter on the statistician's contribution, written jointly by the author and Sheldon Kugler, a biostatistician at Syntex. It is very elementary, but concise and lucid. Next, the investigator's concerns are discussed, including the search for scientific truth, ethical considerations, randomization, informed consent and, writ large, the requirements of the Food and Drug Administration. Another chapter neatly pinpoints the patient's dilemma; for example, "the research patient is held almost on contractual terms to fulfil the study requirements". The first part ends with a summary of the US Food and Drug Regulations and how they have developed. Part two of the book deals with the various aspects of the clinical study. A good chapter on planning and design is followed by a fairly comprehensive one distastefully entitled "Protocol Package", the "detailed written program from the monitor to his investigator team". The next chapter, "Choosing Investigators", gives general advice on the type of investigator likely to be interested in taking part and successful in clinical studies of drugs. There are further chapters on "Filing an IND" (application to the FDA for investigational new drug exemption), on how to handle the experimental observations, and on reaching conclusions. The climax, or anticlimax, of the book is "Filing the NDA", which tells the reader in excruciating but very helpful detail how to complete the latest revision (1967) of the FDA's new drug application form. This is followed by nine "Exhibits" (appendices) reproducing various consent forms and application forms.

The parts of the book that are not about the FDA are easy to read. Clinical investigators of drugs outside the pharmaceutical industry will learn from it how the other half lives, at least in the United States.

A. HERXHEIMER

MERRIFIELD'S METHOD

Solid Phase Peptide Synthesis

By John Morrow Stewart and Janis Dillaha Young. Pp. xi+103. (W. H. Freeman: San Francisco and Folkestone, May 1969.) 48*s*; $5.00.

MERRIFIELD'S method of peptide synthesis has excited enormous interest in recent years. It offers molecular biologists the hope of preparing artificial proteins by an automated process, apparently requiring less chemical skill than classical methods. In view of all the successes of the new method, culminating in the announcement last January of preparation of peptide material built to the specification of ribonuclease *A* and possessing substantial enzymatic activity, it would be churlish to decry its great potential, but it must be remarked that some of the current hopes are exaggerated. Thus experienced chemists, skilled in the art of conventional peptide synthesis, have often been unable to obtain pure products using the new method. Nevertheless, many scientists will wish to use the Merrifield method, and they will find this volume an immense help.

This book is essentially a practical laboratory manual. Every operation, including the highly important ancillary preparations of protected amino-acids as starting materials and the removal of protecting groups, is clearly described in detail. The process of lengthening the peptide chain in solid-phase synthesis and the laboratory apparatus for manually controlled synthesis are also covered thoroughly. The automatic apparatus is only referred to in outline, although Stewart is a pioneer in that area, presumably because few laboratories would attempt to construct it themselves and it will soon be commercially available. A very good feature is a list of references to suppliers of equipment and materials, their addresses and telephone numbers.

Analytical techniques, important for control of the progress of the synthesis, have not been neglected and there is an honest treatment of the question of homogeneity of the product. A more penetrating analysis of this question would, however, have been advantageous. For example, the statement on page 1 that "all the reactions involved in the synthesis can be brought to 100 per cent completion so that a homogeneous product can be obtained" is less than satisfactory. The concept of 100 per cent reaction recurs in the book, whereas a treatment, along the lines published by Bayer, of the connexion between homogeneity and average per cent completion of each stage in synthesis would have been more helpful. Perhaps I am over anxious, but I fear that the literature will be confused with accounts of biological and catalytic properties of "compounds" prepared by enthusiasts who have disregarded the question of purity. A more thorough discussion of the problem in this book would have mitigated this risk. The invention of solid phase peptide synthesis is rather like that of gunpowder; it may be a liberating progressive influence, or it might be a cause of chaos.

Reviewers often comment on value for money, and this book might seem short for the price. On the contrary,